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To the Question of the Degree of Dissemination of the Q-fever among the
Workers of the Cotton Industry.

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In the last 3-4 years a number of separate reports on the outbreak
of Q fever in the cotton establishments of the European region of the
USSR have appeared in our literature. Thus, in 1952 Churakov and co-
workers reported on two outbreaks which were observed in the textile
factories of Ivanov and were connected with cotton which had been ob-
tained from Central Asia. Tokarevich and Vanileva (1955-1956), during
analysis of the morbidity of Q fever in Leningrad, established that the
patients in a majority of the cases were workers of the cotton industry,
and the morbidity in the latter often had a group character and was con-
nected with cotton which had been obtained from Tadzhik SSR and Turkmen
SSR, and partially from the Mari SSR region.

These reports led us to believe in the possibility of cotton infec-
tion in the endemical Q fever areas. In order to verify this assumption,
and clarify the possible paths of infection of the cotton with rickettsia,
we conducted an expedition into one of the cotton-growing areas of Turkmen
SSR (Mari Oblast).

The work was conducted during the cotton-picking period of 1955,
(November) which was helpful in that it allowed the workers of the ex-
pedition to acquaint themselves with the picking process, storage, first
industrial process (separation of the cotton fiber from the seed) which

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preceded transportation to the European section of the USSR. Infection of the cotton at these stages, or during its storage at the factories, could have led to the increase of morbidity among the cotton industry workers.

As is known, the infection of man by an agent of Q fever, even in cases of latent infection, leads to the appearance of antibodies in the serum of these people, and the antibodies can be detected for several years after infection through the aid of a complement fixing reaction with an antigen from the Bernet rickettsia. Therefore we, in order to ascertain the degree of affection among the workers of the cotton factories, studied their serums with the aid of the complement fixing reaction. The reaction was run with an antigen which was prepared in the Institute of Epidemiology and Microbiology (Gamale) ANS USSR.

A total of 605 workers were studied from various cotton-working areas which received cotton from all cotton-growing regions.

The results of the serological studies are in the Table.

During the examination of the ambulatory charts of these individuals whose reaction was positive, it was established that many of them had carried a fever infection at sometime in the past, the clinical of which was similar to Q-rickettsiosis.

In order to reach any conclusion from the data obtained during the serological study of the workers of the cotton establishments, it was necessary to ascertain to what degree the Q fever affects the local population. We examined 108 people who had no connection with cotton. A positive reaction was obtained in 13%, that is, it was detected with almost the same regularity as in workers of the cotton industry.

Along with this, a study of the workers of the local fur handling establishments (Skavinsk and others, 1955) indicated that the number of positive complement fixing reactions with a Q-antigen reached 25%, this significantly surpassed the indications obtained by us.

We tried to isolate the agent of Q fever from the air of the more contaminated cotton plants to include with our serological studies. For this purpose we used the ^(Krotkov) Krotova apparatus which had been used successfully in 1954 for the isolation of the Bernet rickettsia from the air (Bektemirov, 1955). We studied the air from 6 cotton plants in the cities of Mari and Bairam-Ali, these samples were biologically tested on guinea pigs and gave negative results.

During the study of the cotton fields and factories, we focused our attention on the presence of a great number of pigeons in these areas which fed on the cotton seeds. The pigeons contaminate the fields and plants during their stay (a layer of excrement 15 cm thick was found on the roof of one building in the cotton field).

The natural infectibility of the pigeons by Q fever was established by serological means in the endemical regions of Italy. Also proven was the ability of the kidneys of the birds to retain the agent over a period of 42 days (Babudieri, 1951). According to Baburdieri and Moskovich (1950), the birds become infected with Q fever after feeding on the excrement of livestock which is ailing with Q fever.

In Czechoslovakia, Srucsek (1955) experimentally proved the possibility of infecting chickens with the Bernet rickettsia and established that the agent was present in their excrement for some time.

These data stimulated us to study the pigeons of the cotton areas of Vikil-Bazar for Q rickettsiosis. Studies of the blood serum of 90

pigeons in a complement fixing reaction test, and also their excrement in biological tests on guinea pigs gave negative results.

Besides this, we turned our attention to the house mice which inhabit the seed and bale store rooms and also the loom shops of the plants.

The natural infectibility of mice by Q fever was established in Spain (Perets Gallardo, 1952) and in Czechoslovakia (Rashka and others, 1955) through a complement fixing reaction. Parker (1948) established the susceptibility of the house mouse to Q rickettsiosis in his experiments.

With a Gero trap we caught 96 mice, and used their liver and spleen in suspensions for the infection of guinea pigs. A study of the serum of the pigs in a complement fixing reaction with an antigen from the Bernet rickettsia, 30-35 days after infection, gave negative results.

Evidently the house mice and grey pigeons inhabiting the cotton plants and fields are not infected under such conditions and do not infect the cotton.

Thus, we came to the conclusion that there is no infectibility of cotton of the cotton establishments of the Mari regions.

However, the great percentage of positive results in the serological studies of the population led us to continue our search for the cause of infection by Q fever.

Considering the role of cattle as the basic origin of this infection, we conducted serological studies of 81 cows and 76 sheep from various areas of the Mari region. The study showed the affection of the cows to be 13.7%, the sheep-9.2%.

Although the number of examined animals was small, the obtained results do not lead us to doubt the presence of rickettsia in them, and allow us to consider them as one of the origins of infection of humans in that or any locale.

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During questioning of those people whose blood gave a positive complement fixing reaction, we often established their contact with cattle.

We were not studying the natural centre of Q fever, but the great degree of affection of the population and agricultural animals, along with the extensive dissemination of the infection allow us to speak of the endemicity of the Q fever in the Mari region of Turkmen, SSR.

To sum up the obtained data, we can conclude that there is no infectibility of the cotton by the Bernet rickettsia present in the cotton-industrial areas of the Mari region.

The outbreaks of Q fever in cotton growing and processing areas, which are written about in literature, were connected with accidental infections of cotton, analogous with those which were written during the outbreak of Q fever in connection with the thrashing of grain in Yugoslavia (Visik and others, 1953), and also with the feeding of cattle with corn which had been infected with the Bernet rickettsia (Bingel and others, 1952).

Becoming acquainted with the entire picking and processing phase of cotton, we were surprised at the number of possibilities of such accidental infections of cotton. Thus, the cotton can be infected when it is gathered and piled at the road-side, or when it is drying near public roads where cattle feed and contaminate the ground. Also, we revealed that often all of the cotton is not processed the same year, but is left in storage in the fields and plants. Such accumulations of cotton are suitable nesting places for various types of rodents, which are origins of the Q rickettsia according to literature.

Finally, some part of the cotton can become infected during its transportation in railroad cars.

While we do not deny the infectibility of cotton, we do consider that it happens very seldom. However, realizing the fact that there are reports on the outbreak of Q fever in cotton processing areas, we should study its epidemiology in order to know at what level and under what conditions the infection takes place.

III.

Results of a serological study of workers of cotton establishments
in the Mari oblast of Turkmen SSR for Q-fever.

Populated Areas....	Establishment.....	Number of people under study		
		Total	With positive reactions Number	%
Mari	Cotton plant*	243	20	8.6
Mari	Cotton processing factory*	55	3	5.4
Bairam- Ali	Cotton plant*	159	18	11.3
Vikil- Bazap	Cotton Basin	14	1	—
Iolotan	Cotton plant*	134	20	14.9
Total		605	62	10.2

* A cotton plant being the initial processing mill. A cotton
processing factory being the production of cloth etc.

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